

# Study Card for General Chemistry Principles and Modern Applications by Carey Bissonnette F Geoffrey Herring Jeffry D Madura and Ralph H Petrucci 2010 Paperback

**GENERAL CHEMISTRY: Principles and Modern Applications, 10e**  
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 Study Card  
 Prepared by Karl A. Long

**Chapter 1**

1. The scientific method is the process of advancing knowledge through observation, experimentation, and the formulation of laws, hypotheses, and theories (Sec. 1.1).

Fig. 1.1

2. Matter (anything that occupies space, has mass, and displays inertia), can be described in terms of composition and properties. Chemical properties describe the ability of matter to undergo change in composition, while observations of physical properties leads to no change in composition (Sec. 1.2).

3. Atoms are the basic building blocks of matter. Matter composed of a single type of element is known as an element. Compounds are composed of two or more elements, which maintain the discrete groups of atoms bonded together (Sec. 1.3).

4. Matter generally exists in one of three states (solid, liquid, or gas) and can be described in terms of a single substance in the form of elements or compounds or a mixture (either homogeneous or heterogeneous). Heterogeneous mixtures are also called solutions (Sec. 1.5).

Fig. 1.4

5. The SI system of measurement uses seven base quantities (Table 1.1) and uses prefixes (Table 1.2) to indicate different powers of 10 (Sec. 1.4). Measured properties can be dependent (extensive) or independent (intensive) of the quantity of matter observed (Sec. 1.5).

6. Measurements are subject to systematic and random errors. They should be reported with accuracy and precision (Sec. 1.4) and with the correct number of significant figures (Sec. 1.7). Significant figures in calculations for multiplication, division, the result cannot have more significant figures than either of the original numbers.

7. In addition, subtraction the result can have more digits to the right of the decimal point than either of the original numbers (Sec. 1.7).

**Chapter 2**

1. Eighteenth- and nineteenth-century investigations in chemistry led to the development of the law of conservation of mass and the law of constant composition (definite proportions). Following the development of atomic theory Dalton proposed the law of multiple proportions (Sec. 2.1).

2. Following the discovery of electrons, investigations into atomic structure led to the discovery of radioactivity and types of radiation. The typical terms associated with radioactivity are alpha, beta, gamma, positron, and neutron, as well as their associated symbols (Sec. 2.2).

3. The first law model of the atom consists of positively charged protons, containing positive and neutral neutrons, surrounded by negatively charged electrons. Individual atoms are characterized by their atomic number, Z (proton number), and their mass number. A mass of protons and neutrons. The number of neutrons is equal to A - Z (Sec. 2.3).

4. All isotopes can be represented by their chemical symbol, isotopes, stem of the name element that have different mass numbers, are present in different percent parts of abundance, which can be determined through use of a mass spectrometer. Special notations are used to represent different isotopes and ions of an element (Sec. 2.4).

Fig. 2.1

5. Masses of individual atoms are expressed in terms of atomic mass units (amu) with 1 being defined as exactly 1/12 of the mass of carbon-12 (Sec. 2.5). The atomic mass (weighted) of an element is the average of the isotopic masses weighted according to their natural abundance (Sec. 2.5).

6. Elements in the periodic table are in order of increasing atomic number. Elements with similar chemical and physical properties are in the same column (groups). Horizontal rows are called periods. Based on their position, elements can be classified as metals, nonmetals, metalloids, and noble gases. Some, although mostly others, include transition elements and transition elements (Sec. 2.6).

**Chapter 3**

1. The fundamental unit of a molecular compound is the molecule. The structure may be represented by the empirical formula (simplest ratio of atoms) or the molecular formula (actual number of atoms) (Sec. 3.1).

2. Ionic compounds are composed of positively charged cations (typically metal) and negatively charged anions (typically nonmetals) which combine to form an electrically neutral compound. The fundamental unit of an ionic compound is called the formula unit (Sec. 3.1).

3. Chemical formulas may be classified into different categories, including structural formulas, condensed structural formulas, line-angle (skeletal) formulas, ball-and-stick models, and space-filling models (Sec. 3.2).

Fig. 3.1

4. The concept of atomic mass can be extended to the mass of a molecule (molecular mass) or formula unit of an ionic or empirical formula mass. The molecular mass represents the mass of a single molecule of a molecule or the mass of a formula unit of an ionic compound (Sec. 3.2).

5. The mass percent composition of a compound can be determined experimentally (e.g., combustion analysis) or from the chemical formula. Experimental methods yield the empirical formula, which must then be related to molecular formula by using molecular masses (Sec. 3.3).

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## Reviews

*Extremely helpful to all class of individuals. It really is written in straightforward terms instead of difficult to understand. I am just happy to explain how this is the finest publication i have got read inside my own lifestyle and might be he very best ebook for possibly.*




*(Dr. Meta Smith)*

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